

ABSTRACT

A method to attach hydrophilic and/or ionogenic coatings to metallic surfaces robustly. Important applications for the invention extend to sensor types, various biomedical devices, and additional technologies requiring metal coatings with specified properties, such as sensors that employ the Quartz Crystal Microbalance (QCM) principle. This is a method to produce an adherent hydrogel against a metal surface by gelling a liquid mixture of components. The implementation of the invention for QCM ion sensors employs poly(allylamine) (PAH) hydrogels. The reaction of PAH with N-Acetylhomocysteine thiolactone (AHTL) (Fluda) in water under basic conditions produces thiol groups. This reaction removes ion exchange functionality and permits robust attachment of the hydrogel to the QCM's gold electrode. The PAH concentration in the aqueous starting mixture is between 12 and 25 weight percent, the AHTL concentration is between 5 and 25 mole percent of PAH repeat units, and the DadMac concentration is between 10 and 15 mole percent of PAH repeat units. Also, between 1 and 2 equivalents of base (sodium, hydroxide, NaOH) are present per equivalent of PAH repeat units.